

The 3C's Model: A Framework for Development of E-Learning Courses

Sami Alhomod¹, Abdulaziz Omar Alsadhan² & Mohd Mudasir Shafi³

¹ Department of Management Information Systems, Collage of Business Administration, King Saud University, Riyadh, Saudi Arabia

² Department of Software Engineering, Collage of Information and Computer sciences, King Saud University, Riyadh, Saudi Arabia

³ Deanship of Distance and E-Learning, King Saud University, Riyadh, Saudi Arabia

Correspondence: Mohd Mudasir Shafi, Deanship of Distance and E-Learning, King Saud University, Riyadh, Saudi Arabia. E-mail: mmudasir@ksu.edu.sa

Received: September 29, 2013 Accepted: November 11, 2013 Online Published: January 13, 2014

doi:10.5539/cis.v7n1p87

URL: <http://dx.doi.org/10.5539/cis.v7n1p87>

Abstract

The number of students taking online E-learning courses is increasing each day which calls for the delivery of a consistent framework for the development of online courses. This paper presents a new model for the development of online E-courses. The model is called 3C's Model and divides the development of E-learning course into 3 steps; course modeling, course development and course implementation. The model follows the development of E-learning from its initial phase to the final phase when it's actually published online and learners are granted access to it. The 3C's model defines a general framework that can be applied for the development of online E-courses across all disciplines and subjects.

Keywords: education, e-learning, e-courses, online courses, framework

1. Introduction

Traditionally, Education was based on attending classes, listening to lectures and appearing in exams (Albarrak, 2007). This traditional method of imparting education is evolving and new methods are developed day by day. The introduction of information technology in education is viewed as one of the important means of meeting the needs students, universities and society as a whole. Fry (2001) suggests that universities must embrace new technological advancements which are capable of transforming educational and business in order to survive in a global higher education market. The constant and rapid development of Information and communication technology has led to the introduction of online E-learning systems in the system of education. E-learning is now the main focus of introducing and using new and advanced technologies in the field of higher education. E-learning has been defined in different literatures in different ways (Wagner, Hassanein, & Head, 2008). In general, E-learning can be defined as an educational system that delivers the information using the Information technology resources like internet, intranet, satellite broadcast and multimedia applications (Albarrak, 2007; Urdan & Weggen, 2000). The main aim of E-learning systems is to improve the whole educational system and to enhance the interaction between students and teachers (Nycz & Cohen, 2007).

E-learning systems are often used in distance learning education in different countries enabling students to obtain degrees online. In 2006, about 3.5 million students in United States were taking online courses at different level of their higher education (Nagy, 2005). According to the recently conducted report by Sloan consortium, over 6.1 million students in United States have taken an online course during fall 2010. Another result of their study was that over 65% of higher educational institutions regarded online learning as a critical part of their longtime strategy (Allen & Seaman, 2011). The future delivery of education is seen through E-learning systems providing teachers with superior and enhanced teaching tools (Organero & Kloos, 2007).

As the enrolment of students into E-learning courses continues to increase each day, the creation and delivery of high quality E-courses content is becoming equally important. One of the ways to ensure the successful delivery of E-learning is to maintain standardization among the design and development of E-courses. Employing a consistent framework for the development of E-courses is Important when introducing an E-learning system.

This can effectively make students comfortable with different courses and reduce the time taken by each student to understand the course structure which in turn can allow students to spend more time on understand the content material of the course. Development of E-courses according to a certain framework can ease the production of content as well as take advantage of internet as a teaching and learning tool.

This paper proposes the 3C's model as a reference for the development of online E-courses. The paper is organized as follows; first a brief account of background of the study and related literature review is presented. Second the challenges and issues in the development of online courses will be presented. Third, the 3C's model will be presented in detail. And at last summary and conclusion to the study will be provided.

2. Background and Literature Review

E-learning is one of the largest subsectors of global education market. There are a wide variety of E-learning definitions. So it's difficult to estimate the size of the E-learning market (Wagner, Hassanein, & Head, 2008). Global Industry Analysts, Inc. (GIA) in 2010 published a report which estimates the global E-learning market to reach \$ 107.3 by 2015. However there is a little doubt that E-learning courses are becoming more popular each day with thousands of students joining the new courses each day. A survey of online courses reveals that most of the courses are mostly text based. A less number of courses are specifically designed for internet that combines smaller components to make a complete online course (Chin & Williams, 2006).

There are a number of factors that can have an Impact on the successful development of an online E-course. Papp (2000) identified intellectual property, suitability of course content, building E-learning course, suitability of E-learning course and measuring the success of E-learning courses as critical success factors for any E-learning system.

A review of literature related to E-course development indicated Interaction as an important factor that can enhance learning experience. The Interactions were classified by Moore (1989) as student-content, student-instructor, and student-student. Later Hillman, Willis and Gunawardena, (1994), added another type of instruction and named it as student-interface. Newberry and Logofatu (2008) said that quality of interactions is as important as the quality of content of an online E-course. According to Johnson (2007) in order to use technology to its best effect, it's important to carefully plan, manage and execute these interactions.

Chou in 2003 identified type of media, exchange of information and interaction between members of class as the dimensions for development of an E-course. Dennen, Darabi and Smith (2007) also derived similar dimensions for the development of E-course. According to Newberry (2008, p. 584), "*The content of an online course should be organized around goals and should be presented in a clear and simple manner*". The simplicity of the course material and ease of adding information has also been defined as an important dimension into the development of online E-courses.

One of the important elements in the development of an online E-course is the availability of the study guides. Any successful E-course must include a study guide that may include objectives of the course, list of resources needed to complete the course and the description of assignments (Carr-Chellman, 2000). A study guide can be used to organize the student interaction and as well as organize the contents of course.

The importance of online tools to develop the E-courses has also been discussed. Owston (1997) says that online tools are easy to organize contents and add flexibility to an online learning environment. Online tools also enhance the interaction capabilities of an E-course (Newberry, 2005). In order for an E-course to reach it intended outcome, it's important to organize material (Carr-Chellman, 2000). Proper organization of material ensures that the objectives of an online course are achieved. Good organization of contents in an E-course also ensures better level of communication between faculty and students (Phipps & Merisotis, 2000).

Organero and Kloos (2007) identified Motivational factors as the most important factors for the successful implementation of an E-course. They studied Forums and Assessments as the tools for motivation in E-learning courses.

An extensive review of literature identified that there are a number of models that have been proposed for the development of E-courses. Dan Tian (2005) presented the design and implementation of E-learning courses with hierarchical subject structures. He proposed the use of Learning Advancement Management System (LAMS), a web based software for the development of online E-courses. Newberry (2008) proposed the use of templates for the development of E-courses. The development of the templates is based on ADDIE model of E-course development. Chin and Williams (2006) study the example of "Universitas 21 Global", an online institution offering courses to students and proposed a theoretical framework for E-courses design.

3. Challenges and Issues in Development of an Online E-course

There are many issues and challenges associated with the development of an online E-course. Madhukar (2002) pointed out some of the negative influences of using internet as a medium of E-learning. He argued that introduction of internet as an E-learning tool reduces the student concentration on studies and is time consuming. He also argued that this makes student dependent on internet and in turn restricts student to gain knowledge by research. Another study conducted by Alexander and McKenzie (1998) pointed out certain factors which may result in the failure of E-learning systems. According to them failure to prepare students for using E-learning and not obtaining the copyright clearance may result in the failure of E-learning.

These issues and challenges if not addressed adequately may seriously dent the purpose of an online course and will not serve the purpose for its creation. Some of the challenges that can seriously impact the success of an online course are:

3.1 Inadequate Planning

The objectives of any online E-course can't be achieved if there isn't any specific plan regarding the development and distribution of the course. The course developed must cater to the needs of its targeted audience.

3.2 Insufficient Support

Any online course can't be successful if there isn't sufficient support provided to the users of the course. From a student's point of view, an orientation program on how to access and use the course must be conducted. As far as faculty is concerned, training and ownership of the courses must be provided to them. There must also be dedicated online support available at all the times. Insufficient support will result in lack of interest from the users and will ultimately result in under achieving of the objectives for which course was created.

3.3 Lack of Easy Access

The contents of the course to be developed must be easily accessible to all the people intended to use the course. There must also be a single point of access to the course. Lack of easy access may also have a serious impact on the success of the course.

3.4 Evaluation

Any online course must be checked for its quality in terms of course content and course presentation. An initial check on whether students are ready to accept the course must be conducted. The course should also be checked for quality at all the times for continuous course development.

3.5 Lack of Standards

A set of standards must also be followed while developing an online course. The standards must be followed while implementing the technological infrastructure for the development of the course. The course must not also have an inconsistent look and feel and the guidelines to follow the course must be defined.

4. The 3C's Model

The development of E-learning courses varies in their size and complexity depending upon the objectives and needs of an organization. E-learning courses if developed with a proper framework can be delivered to different learners at different moments of time using the same material again and again. It's very important to employ a consistent model for each E-learning course. To structure and develop an online E-learning course which can be employed for any online or distance learning course, regardless of the discipline, this paper proposes the 3C's model. 3C is an acronym for:

C = Course Modeling

C = Course Development

C = Course Implementation

The goal of this model is to propose a basic and robust framework that can be employed for the development of online E-courses. The purpose of this model is to be comprehensive and can be applied for development of small E-learning course as well as for the complex online E-learning project. There are 4 main stakeholders in this model: Subject matter experts, technologists, Educators and the final users of the system to be developed. The 3C's model is intended to develop the online E-courses through a sequential and systemic process which is explained below:

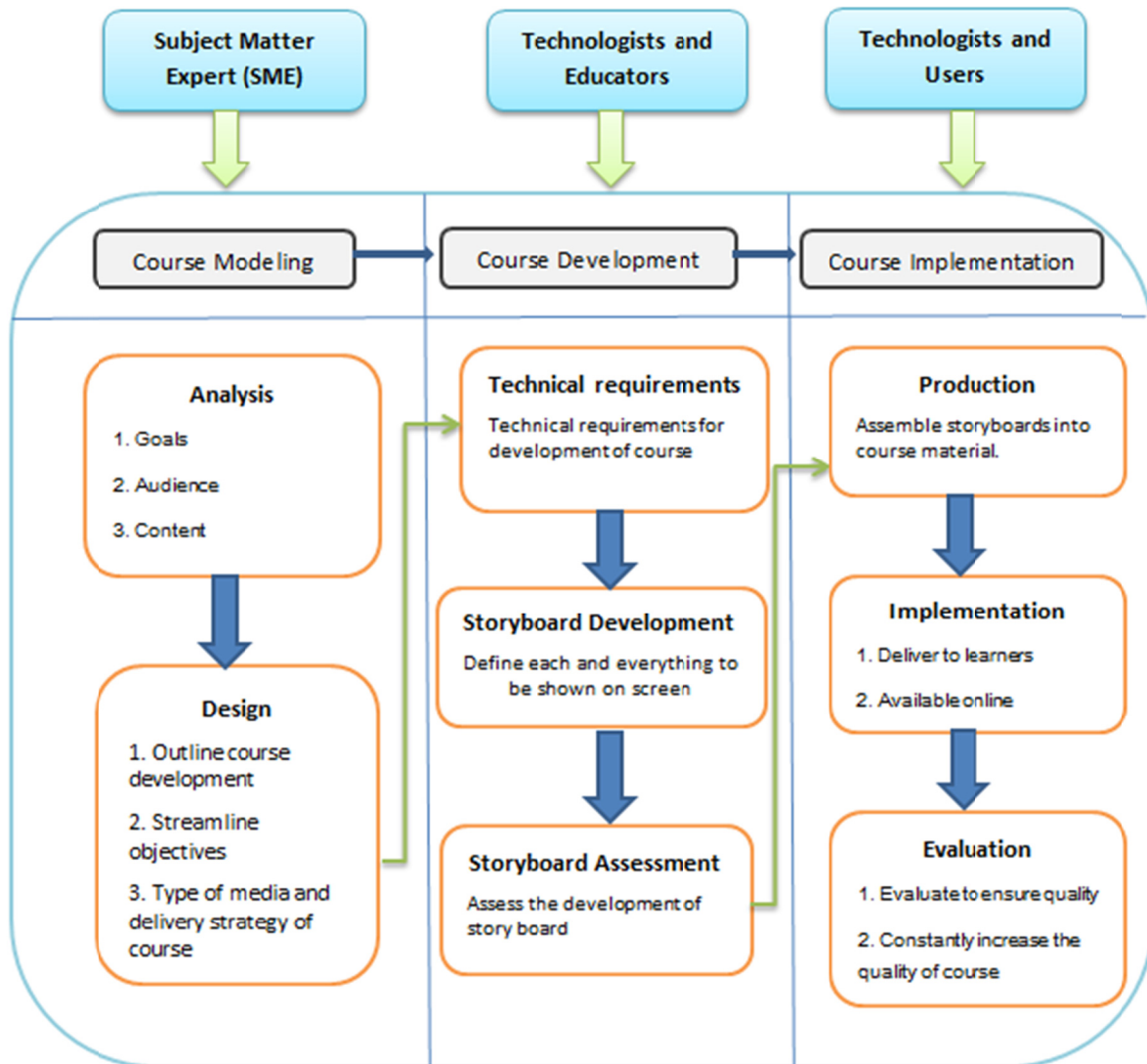


Figure 1. The 3C's model

4.1 Course Modeling

This is the first step of an online E-course development. This step is developed with the help of subject matter experts (SME). The aim of this step is to gather the requirements of the learners and create a basic outline about how the course should be developed. This phase is divided into two more sub steps:

4.1.1 Analysis

An analysis is needed to determine whether E-learning course is needed in an organization. The aim of this phase is to define high level course goals. The development of an E-learning course will hugely depend on the learners intended to use the course. In this phase we will identify the target audience of the course and the content to be developed for the course. The analysis of the content would mean defining the organization and the amount of content to be put in the online course. In this phase we will also identify the environment and the time at which learners will take the course.

4.1.2 Designing the Course

This is the second phase under course modeling. In this phase all the information gathered under requirements is constantly implemented under the design. In this phase, defining the sequence of achieving the objectives is documented and pictured. This phase also defines the learning objectives which underline the objectives of the course. This phase identifies the media to be used in the course and the delivery strategy of the course content. In case content already exists, then this phase converts the content into online material and tries to improve the

quality of the content. The result of this phase is to provide a basic outline on the basis of which course will be developed. At the end of this phase, course structure i.e. chapters, lessons, activities are defined and the delivery method of the course is well understood. The delivery method can be either interactive self-paced material, synchronous and/or asynchronous collaborative activities.

4.2 Course Development

This stage of online course development is carried out with the help of technologists and educators. In this stage E-learning content is actually produced on the basis of the blueprint provided in the course modeling phase. Depending on the availability of the resources the content may be developed. The developed content may vary from simpler text documents with no multimedia of interactivity to audio and video files as well as assignments and tests. This phase is divided into 3 sub steps:

4.2.1 Technical Requirements

In this step the technical specifications like tools, languages and platforms to be used for the development of system are defined. The technical requirements like the speed of internet and audio/video capabilities of the course are also defined. All these requirements are well documented and system is developed with these technical specifications.

4.2.2 Storyboard Writing

At this step, all the learning objectives defined in the design phase are used to write storyboards which define each and everything that will be shown on screen and everything that will be heard. A separate storyboard is created for each screen. Each storyboard of the screen defines the text, graphics, audio and video to be shown on screen. Storyboards are constantly reviewed by the editor and need the approval of stakeholders and subject matter experts.

4.2.3 Storyboard Assessment

In this step the story board developed can be put to a test to be evaluated by stakeholders and their feedback is constantly implemented in each storyboard. Each storyboard is reviewed at this step and each agreed storyboard is moved into next stage of production. This step is also called formative evaluation.

4.3 Course Implementation

This is the last Phase of our 3C's model. It's further divided into 3 steps:

4.3.1 Production

During this step all the agreed storyboards are brought into production and assembled into course. This step involves creation of text, audio, video and media files. With the help of the web developer and some authoring tool, all the media produced is assembled to produce a running and published version of the course.

4.3.2 Implementation

In this phase, the course developed is actually delivered to learners by installing it on server and granting access to the learners to the courseware. The implementation of the courseware requires the involvement of subject matter experts, faculty as well as the administrators of the course.

4.3.3 Evaluation

Once the courseware is successfully implemented, it must be evaluated for specific purposes. The evaluation of the developed E-course is done to ensure quality of the course. This step involves testing the course once it's online. If the course is not performing as it was intended to do then the development of course is not successful. Under this step the course is evaluated for its acceptability from the user as well as for its functioning. According to Kirkpatrick, 2006, evaluation can be done on the basis of learner's reaction, learning, behavior and results.

Learner's reaction can be measured through surveys and questionnaires. Evaluation of learning can be done on the basis of achievement of objectives. Learning can be evaluated through assessments and tests. Behavior can be evaluated on the basis of learner's interest in the course and results can be evaluated on the basis of changes that have occurred in terms of increased quality of the course.

5. Conclusion and Future Work

With the advancement in computers and technology, traditional way of education has changed from being confined to a classroom to an open anytime, anywhere learning. The system of education and learning has been changed with the introduction of online E-courses. There has been a rapid change in the development of online courses and certifications. The successful development of E-courses is necessary for it to be useful to learners.

E-courses should be developed so that they can cater the need of both teacher and learner. Also quality of E-course must be ensured before it goes into production phase till it's actually implemented and published online and post implementation quality assurance is necessary to constantly modify and upgrade the course. This requires for a consistent model for the development of these online E-courses. The main objective of the paper is to propose a general framework for the development of online E-courses. The framework is called 3C's model and is divided into 3 main phases: Course modeling, course development and course evaluation. Each phase is divided into sub steps which define each process of E-course development.

This paper only presents a model for development of online E-Learning courses. In future, we would like to apply this model to develop online E-learning courses to evaluate the efficiency and analyze the validity of this model. In addition, we will constantly try to improve this model based on the results of its application.

References

- A Global Strategic Business Report. (2010). *Global Industry Analysts, Inc.* Retrieved from http://www.strategyr.com/eLEARNING_Market_Report.asp
- Ahmed, I. A. (2007). Designing E-learning Systems in Medical Education: A Case Study. *Sixth International Internet Education Conference.*
- Alexander, S., & McKenzie, J. (1998). *An evaluation of information technology projects for university learning.* Canberra, Australia: Australian Government Publishing Services (AGPS).
- Allen, E., & Seaman, J. (2011). *Going the Distance Online Education in the United States, 2011.* Sloan consortium. Retrieved from http://sloanconsortium.org/publications/survey/going_distance_2011
- Carr-Chellman, A. (2000). The ideal online course. *British Journal of Educational Technology, 31*(3), 229-422. <http://dx.doi.org/10.1111/1467-8535.00154>
- Chin, S. T. S., & Williams, J. B. (2006). A theoretical framework for effective online course design. *MERLOT Journal of Online Learning and Teaching, 2*(1), 12.
- Chou, C. (2003). Interactivity and interactive functions in web-based learning systems: A technical framework for designers. *British Journal of Educational Technology, 34*(3), 265-279. <http://dx.doi.org/10.1111/1467-8535.00326>
- Dan, T. (2005). Progress-Based E-Learning Courses with Hierarchical Subject Structures. *Proceedings of the Fifth IEEE International Conference on Advanced Learning Technologies (ICALT'05).*
- Dante, D. C., Laura, F., Gaetano, M., & Isabella, S. (2006). Development of didactic design guidelines for the production of e-courses. *36 ASEE/IEEE Frontiers in Education Conference.*
- Dennen, V. P., Darabi, A. A., & Smith, L. J. (2007). Instructor-learner interaction in online courses: The relative perceived importance of particular instructor actions on performance and satisfaction. *Distance Education, 28*(1), 65-79. <http://dx.doi.org/10.1080/01587910701305319>
- Fry, K. (2001). E-Learning Markets and Providers: some issues and prospects. *Training and Education, 43*(4), 233-239. <http://dx.doi.org/10.1108/EUM0000000005484>
- Garcia, H., & Centeno, M. A. (2009, December). SUCCESSFUL: a framework for designing discrete event simulation courses. In *Simulation Conference (WSC), Proceedings of the 2009 Winter* (pp. 289-298). IEEE.
- Georgouli, K., Skalkidis, I., & Guerreiro, P. (2008). A Framework for Adopting LMS to Introduce e-Learning in a Traditional Course. *Educational Technology & Society, 11*(2), 227-240.
- Hillamn, D. C., Willis, D. J., & Gunawardena, C. N. (1994). Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners. *The American Journal of Distance Education, 8*(2), 30-43. <http://dx.doi.org/10.1080/08923649409526853>
- Johnson, E. S. (2007). Promoting learner-learner interactions through ecological assessments of the online environment. *MERLOT Journal of Online Learning and Teaching, 3*(2), 142-154.
- Lam, J., Cheung, K. S., Ng, J., Yau, J., Seto, W., & Im, T. (2008, December). Students' needs of e-courses as complement to traditional learning: A Japanese studies e-course case. In *IT in Medicine and Education, 2008. ITME 2008. IEEE International Symposium on* (pp. 876-880). IEEE.
- Madhukar, I. (2002). *Internet based distance learning.* Delhi, India: Authorpress Global Network.

- Mario, M. O., & Carlos, D. K. (2007). Using Forums and Assessments as Motivational Tools in E-learning Courses: A Case Study. *Proceedings in Frontiers in Education Conference 11*. <http://dx.doi.org/10.1109/FIE.2007.4417812>
- Moore, M. G. (1989). Three types of interaction. *American Journal of Distance Education*, 3(2), 1-7. <http://dx.doi.org/10.1080/08923648909526659>
- Nagy, A. (2005). The Impact of E-Learning. In P. A. Bruck, A. Buchholz, Z. Karssen & A. Zerfass (Eds.), *E-Content: Technologies and Perspectives for the European Market* (pp. 79-96). Berlin: Springer-Verlag. http://dx.doi.org/10.1007/3-540-26387-X_4
- Newberry, B. (2005). The use of bulletin boards for discussions in online learning. *International Journal of Instructional Technology and Distance Learning*, 2(11), 37-46.
- Newberry, B., & Cristina, L. (2008). An Online Degree Program Course Template Development Process. *MERLOT Journal of Online Learning and Teaching*, 4(4).
- Nycz, M., & Cohen, E. (2007). The basics for understanding e-learning. *Principles of effective online teaching*, 1-17.
- Owston, R. (1997). The World Wide Web: A technology to enhance teaching and learning? *Educational Researcher*, 26(2), 27-33.
- Papp, R. (2000). Critical success factors for distance learning. Americas Conference on Information Systems. California, USA: Long Beach.
- Phipps, R., & Merisotis, J. (2000). *Quality on the line: benchmarks for success in Internet-based distance education*. Washington, DC: Institute for Higher Education Policy (ED 444 407). Retrieved from www.ihep.com/quality.pdf
- Titi, K. M., & Marie, O. A. (2009, April). Protecting E-courses Copyright in M-learning Process. In *Future Computer and Communication, 2009. ICFCC 2009. International Conference on* (pp. 636-640). IEEE.
- Urdan, T. A., & Weggen, C. C. (2000). *Corporate e-learning: exploring a new frontier*. WRHAMBRECHT+CO. Retrieved from http://cclp.mior.ca/Reference%20Shelf/PDF_OISE/Corporate%20e-learning.pdf
- Wagner, N. L., Hassanein, K., & Head, M. M. (2008). Who is Responsible for E-Learning Success in Higher Education? A Stakeholders' Analysis. *Educational Technology & Society*, 11(3), 26-36.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/3.0/>).